**Aqueous chlorine**

1. (a) Chlorine water is formed by adding chlorine gas to water. Some of the

chlorine dissolves in water and some reacts with water.

Explain what happens to a piece of blue litmus paper when it is used to test the

chlorine water.

In your answer you should:

• describe the observations you would make of the blue litmus paper

• explain your observations by linking them to the properties of the chlorine

water

• write a balanced symbol equation for the reaction of chlorine gas with water.

(b) In hospitals, chlorine-based solutions are used in cleaning and disinfecting to

help protect patients from infection. Justify why chlorine-based solutions are

used in hospitals by explaining how the **chemical** properties of chlorine-based

solutions make them suitable for cleaning and disinfecting.

**2.** Chlorine may be added to water in swimming pools to make the water safe for people. Discuss the chemistry involved in using chlorine to treat swimming pool water. In your answer, you should:

write a word equation for the reaction of chlorine with water

explain how chlorine forms an acidic solution when it reacts with water

write a balanced chemical equation for the reaction of chlorine with water

fully explain how a particular product of the reaction of chlorine with water makes the water safe for people to swim.

**3.** Chlorine is the chemical most often used to keep swimming pools and spa pools free from bacteria. Too many bacteria can be hazardous to human health.

Discuss the properties and reactions of chlorine that enable it to keep pool water clean.

(a) Explain how chlorine reacts with water.

Include a relevant balanced equation.

(b) Explain how the addition of chlorine keeps the pool water free from bacteria.

(c) Explain why chlorine needs to be added to pool water at regular intervals.

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